**Purpose:**

To install the most recent Jetty as a standalone service on Linux. This process describes a command-line installation, so should work on most Linux flavours. It closely follows that outlined by the Jetty:// instructions for CentOS7/RHEL7. It creates a ‘jetty’ user. It also includes installation of geonetwork, since that is a reasonably complex application example.

Despite many apparent steps, there are actually the following phases:

1. download the jetty webserver application
2. create a jetty user
3. create necessary folders, parameters, files and links to run jetty as a service. Jetty options will be located in /etc/default/jetty, and link to startup file jetty.sh (or actual file) is placed in /etc/init.d/jetty
4. start the jetty application to auto-run as a service. This involves linking init.d/jetty to the runLevel.

The result could be one of the following directory structures:

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| --- | --- | --- | --- |
| **/opt/jetty/<distro>** | | **/opt/jetty/temp** | **/opt/mybase** (could be /opt/gn321) |
| |\_ start.jar | |\_resources/ | - - to be used by system - - | |\_logs/ |
| |\_ bin/ | |\_images/ | **/etc** | |\_start.d/ |
| |\_ lib/ | |\_modules/ | |\_default/jetty | |\_webapps/ |
| |\_modules/ | |\_jcs\_caching/ | |\_init.d/jetty | |\_start.ini (only **if** no start.d) |
| |\_etc/ | |\_src/ | |\_rc?.d |  |
|  | | | |
|  | | | |
| **/usr/share/jetty9** | | **/var/cache/jetty9** | **/var** |
| |\_ start.d/ | |\_resources/ | - - to be used by system - - | |\_log/jetty9/ |
| |\_ bin/ | |\_images/ |  | |\_lib/jetty9/webapps |
| |\_ lib/ | |\_modules/ |  | |\_local/ |
| |\_logs/ | |\_jcs\_caching/ |  | |\_gn\_dir/ |
| |\_etc/ | |\_src/ |  | |\_gs\_dir/ |
|  |  |  |  |

| **Step** | **Major Activity** | **References, Forms and Details** |
| --- | --- | --- |
| **1** | Download the most recent Jetty package from  *http://www.eclipse.org/jetty/download.html* | * Select the .tgz version * Copy the path, and use with wget |
| **2** | Create folders  *sudo mkdir –p /opt/jetty/temp*  *sudo mkdir –p /opt/mybase* | * ***/opt/jetty*** will hold the Jetty distroas a subfolder * ***/opt/jetty/temp***temporary directory assigned to Java by the Service Layer * ***/opt/<mybase***is where the specific set of webapps will be located, including all server configuration. The name ‘mybase’ should be replaced with a desired name. |
| **3** | Extract the downloaded archive  *sudo tar zxvf <jettyDistro>.tar.gz –C /opt/jetty/* | * <jettyDistro>.will be used without modification * Customizations will occur in the mybase folder |
| **4** | Set up symlinks to folders  *export* JETTY\_HOME=/opt/jetty/*<jettyDistro>*  *export* JETTY\_BASE=/opt/mybase  Check: env | grep JETTY | * links are temporary for this session * later will place links in /etc for future startups |
| **5** | Create a user called jetty to run the webserver on system start-up  *sudo useradd --shell /bin/false \*  ***- -*** *home-dir /opt/jetty/temp jetty*  *sudo usermod –a –G jetty {mySysID}* | * user jetty, in group jetty * no shell access * home directory as shown * add whomever (replace {mySysID}) as user(s) to group jetty |
| **6** | List users and groups:  for user in $(awk -F: '{print $1}' /etc/passwd); do groups $user; done | * should see user jetty as a member of group jetty * should also see all {mySysID} users as members of group jetty |
| **7** | Change ownership of jetty directories  *sudo chown –R jetty:jetty /opt/jetty*  *sudo chown –R jetty:jetty /opt/mybase* | or not: sogadmin might be better |
| **8** | Optional Jetty test 1 – basic start :  *cd $JETTY\_HOME*  *java –jar start.jar*  then use browser to http://localhost:8080 | Feedback should describe   * logging initiated * deployment monitoring location * server start on port 8080 |
| **9** | Optional Jetty test 2 – start demos:  *cd $JETTY\_HOME/demo-base*  *java –jar $JETTY\_HOME/start.jar*  then use browser to http://localhost:8080 | * feedback as above * in browser, should see splash screen with several examples accessible |
| **10** | Initialize $JETTY\_BASE directory  *cd $JETTY\_BASE*  *sudo –u jetty java –jar $JETTY\_HOME/start.jar \*  ***- -*** *create-startd \*  ***- -****add-to-start=http, deploy,* *console-capture, jsp, jndi* | Result should be:   * *webapps/* directory (empty) * *logs/* directory (empty) * *start.d/* directory with \*.ini files * “add-to-start” generates the ini files in start.d folder. *No spaces* in “add-to-start” string * include jndi if using that type of databaseconnection * webserver not yet running |
| **11** | Place symlink for the Jetty web server in /etc/init.d/ to point to startup script  *sudo ln -s /opt/jetty/<jettyDistro>/bin/jetty.sh \*  */etc/init.d/jetty*  *Check :*  *ls –l /etc/init.d/jetty* | * don’t omit the –s option * use the ls –l command to confirm installed link to jetty.sh * should see link from jetty to jetty.sh location * alt to the symlink approach is to copy the jetty.sh file to init.d/jetty (\*not\* preferred) |
| **12** | Insert variables into /etc/default/jetty file  JETTY\_HOME=/opt/jetty/*<jettyDistro>*  JETTY\_BASE=/opt/mybase  JETTY\_USER=jetty  TMPDIR=/opt/jetty/temp  JETTY\_PORT=8080 (optional)  JETTY\_HOST={ip-address} (optional) | * the contents will be read by /etc/init.d/jetty.sh * set <mybase> to the actual folder * port could be set to 80, then no need to specify in http call * {ip-address} could be localhost (the default) or other symbolic name |
| **13** | Insert variable into /etc/default/jetty file  JAVA\_OPTIONS=\  “ -Xms512m -Xmx1g –Xss2M “ | Java memory options   * Decrease Xms and Xmx if limited memory |
| **14** | Add WAR files to  *$JETTY\_BASE/webapps*/ | These could be:   * geonetwork.war * geoserver.war * any add-ins |
| **15** | Expand the WAR files via unzip  Move the war file out of webapps, or it will take precedence | * often modify the expanded WAR files to point at a database like PostGIS |
| **16** | Insert variable into /etc/default/jetty file  JAVA\_OPTIONS ="$JAVA\_OPTIONS \  -Djava.awt.headless=true \  -Djeeves.filecharsetdetectandconvert=enabled \  -Dmime-mappings=$JETTY\_BASE/webapps/\  geonetwork/WEB-INF/mime-types.properties \  -~~DSTOP.PORT=8079~~ \  -~~DSTOP.KEY=geonetwork~~ \  " | Jetty housekeeping options   * STOP.PORT and STOP.KEY are required if there is desire to run in foreground and to use   *java –jar $JETTY\_HOME/start.jar ‑ ‑stop* |
| **17** | Set app data locations /etc/default/jetty file  JAVA\_OPTIONS ="$JAVA\_OPTIONS \  -Dgeonetwork.dir=/data/gn\_dir \  -Dgeonetwork.lucene.dir=/data /gn\_dir/index \  -DGEOSERVER\_DATA\_DIR=/data /gs\_dir" | Application options (like Geonetwork and geoserver)   * variables are pointers to   + gn\_dir,   + lucerne\_dir (index)   + gs\_dir if app included |
| **18** | Check the configuration before starting  *service jetty check*  Carefully examine the listings for errors   * the three batches of java options * the jetty parameters | * Will list the configuration and detect errors before running the service, so they can be corrected. Often there are minor configuration errors. * Should see “jetty NOT running”. If running, issue   *sudo service jetty stop* |
| **19** | Check that jetty not still running in ram:  *service jetty status*  and identify pid:  *ps -ef | grep jetty*  *kill -9 <pid>*  (if necessary) | * can have apps half-open as a result of previous implementation attempts and have a failed start due to duplicates detected * cntl/z to exit status request * if running, stop jetty |
| **20** | Configure the service to auto start, by :  If Debian (Ubuntu/Linux Mint):  *sudo update-rc.d jetty defaults*  ElseIf RedHat/Fedora/CentOS:  *sudo chkconfig - - add jetty*  *sudo chkconfig - - level 3 4 5 jetty on* | * need to link init.d script to runLevel (rc…) * to disable auto-run, issue   *update-rc.d –f jetty remove*   * to prevent links from re-establishing on upgrading a package, also issue   *update-rc.d jetty stop 80 0 1 2 3 4 5 6* |
| **21** | Check that run levels set for auto-run:  *ls –l /etc/rc?.d/\*jetty* | * should see run levels (rc)   + 0,1,6 with K (kill)   + 2,3,4,5 with S (start)   + All with priority 01 |
| **22** | Start as a service from $JETTY\_BASE   * *cd $JETTY\_BASE* * *sudo –u jetty service jetty start*   Check the jetty log and the geonetwork log for errors   * cd $JETTY\_BASE/logs | * start as user jetty (?) * can take a minute or two, then the command line response resumes * can start as an application   *java –jar $JETTY\_HOME/start.jar* |
| **23** | Jetty and apps can be accessed via  *http://{ip-address}:8080* |  |
| 24 | Can examine the configuration as:  *java -jar $JETTY\_HOME/start.jar - -list-config* | * may need to explicitly list $JETTY\_HOME * issue command from $JETTY\_BASE location, or will get slightly misleading information * tabular format is thorough, showing jetty and java environments and all jetty jar files |
| 25 | Reboot computer for clean start   * check that jetty is running |  |